

What is claimed is:

1. A variable group delay unit comprising:

an input/output waveguide element for introducing and deriving light;

a light reflecting element arranged with a spacing to said input/output waveguide element to reflect light;

a multiple reflecting device provided on an optical path in which a light introduced by said input/output waveguide element reflects upon said light reflecting element and returns to said input/output waveguide element;

a first lens provided on the optical path between said multiple reflecting device and said input/output waveguide element; and

a second lens provided on the optical path between said multiple reflecting device and said light reflecting element;

whereby said multiple reflecting device has a first interface facing to said first lens and a second interface as a surface opposite thereto that are parallel with each other to multiple-reflect a light incident on said multiple reflecting device by said first interface and second interface, said multiple reflecting device having a third interface having a slant surface at an angle of from

90 degrees or more to 180 degrees or less to said first interface.

2. A variable group delay unit according to claim 1, wherein a light introduced by said input/output waveguide element is incident on the third interface of said multiple reflecting device and exited at the first interface or second' interface, a light reflected by said light reflecting element being incident on the first interface or second interface and exited at the third interface.

3. A variable group delay unit according to claim 1, wherein said multiple reflecting device has an angle ranging from 150 degrees or more to 175 degrees or less defined between the first interface and the third interface.

4. A variable group delay unit according to claim 1, wherein said light multiplex reflector has a anti-reflection coating for a light at a set wavelength band formed in a region to pass light and on the third interface a reflection film having a reflectance of 60% or more at a set wavelength band formed at least in a region to pass or reflect light on the first interface and second interface.

5. A variable group delay unit according to claim 1, wherein the first interface and said second interface of

said light multiplex reflector are formed by working both surfaces of a substrate transparent at a wavelength band used.

6. A variable group delay unit according to claim 1, wherein said first lens has an anamorphic lens to make a light traveling while reflecting within said multiple reflecting device "such that a spot diameter in an interference direction thereof is smaller than a spot diameter in a direction orthogonal to the interference direction.

7. A variable group delay unit according to claim 1, wherein said input/output waveguide element is formed by any one of a single-mode optical fiber, a multi-mode optical fiber, a grating index optical fiber, a dispersion shift optical fiber, a polarization maintaining optical fiber and a planar waveguide.

8. A variable group delay unit according to claim 1, wherein said first lens and said second lens are formed by combining one or more of a ball lens, a spherical lens, a graded refractive index lens, an aspherical lens, a cylindrical lens, a multi-mode grating fiber lens and an anamorphic prism, and have an anti-reflection coating for a set wavelength formed on a surface that light is to be incident.

9. A variable group delay unit according to claim 1, wherein said light reflecting element is formed with a planar surface in a region where an exit light from said second lens is incident, a reflection film having a reflectance of 90% or more for a set wavelength band being formed in the region.

10. A variable group delay unit according to claim 1, wherein said light reflecting element is formed with a curved surface in a region where an exit light from said second lens is to be incident, a reflection film having a reflectance of 90% or more for a set wavelength band being formed in the region.

11. A variable group delay unit according to claim 8, wherein said first lens is structured by a composite lens having at least two kinds of lens, said composite lens at least having said collimate lens to make a light exited from said input/output waveguide element into a parallel light and an anamorphic lens to make a light traveling while reflecting within said multiple reflecting device such that a spot diameter in an interference direction thereof is smaller than a spot diameter in a direction orthogonal to the interference direction.

12. A variable group delay unit according to claim 1, wherein an optical part moving device is provided to vary a distance between at least one of said second lens

and said light reflecting element and said multiple reflecting device.

13. Having a variable group delay unit according to claim 1, an optical coupling device for optically coupling to an input/output waveguide element of said variable group delay unit, a light introducing element for introducing light to said input/output waveguide element through said optical coupling device, and a light deriving means for deriving an exit light from said input/output waveguide element through said optical coupling device.